

What is claimed is:

- 5 SUB A1 1. A recombinant nucleic acid comprising a nucleotide sequence encoding one or more toxic agents operably linked to a pathogen-specific or tissue-specific promoter.
- 10 SUB A2 2. The nucleic acid of claim 1, wherein the nucleic acid comprises more than one toxic agent.
- 15 SUB A2 3. The nucleic acid of claim 1, wherein the toxic agent is toxic gene product.
- 20 SUB A2 4. The toxic gene product of claim 3, which is an Addiction System toxin.
- 25 5. The toxic gene product of claim 3, which is a chromosomally encoded bacterial toxin.
- 30 6. The toxic gene product of claim 3, selected from the group consisting of *ccdB*, *kid*, *perK*, *parE*, *doc*, *higB*, *chpAK*, *chpBK*, *kicB*, *hoc*, *srnB*, *flmA*, *pmdA*, *relF*, *gef*, *kilA*, *kilB*, *kilC*, *kilE*, *traL*, *traE*, *sigB*, *hok*, *pemK*, *lysostaphin*, and *kikA*.
- 35 7. The nucleic acid of claim 1, wherein the toxic agent is an antisense RNA.
8. The nucleic acid of claim 7, wherein the antisense RNA comprises the sequence of *DicF1*, as presented in Figure 18 (SEQ ID NO:8).
9. A nucleic acid comprising the nucleotide sequence of *DicF1*, as presented in Figure 2 (SEQ ID NO:8).
10. A nucleic acid comprising the nucleotide sequence of a *DicF1*-like antisense RNA.
11. The nucleic acid of claim 2, wherein at least one toxic agents is a trans-acting ribozyme and a at least one toxic agent is toxic gene product.

12. The nucleic acid of claim 1, wherein the toxic agent is a toxic gene product, and wherein the nucleic acid further encodes one or more autocatalytic ribozymes and optionally, one or more trans-acting ribozymes.

13. The nucleic acid of claim 1, wherein the toxic agent is sense RNA.

14. The nucleic acid of claim 13, wherein the sense RNA is targeted to an essential antisense molecule.

15. The nucleic acid of claim 1, wherein the promoter is selected from the group consisting of a bacterial-specific promoter, a viral-specific promoter, a liver-specific promoter, a prostate-specific promoter, an epidermal-cell specific promoter, an ilium-specific promoter, a breast-specific, and a smooth muscle-specific promoter.

16. The nucleic acid of claim 1, wherein the pathogen-specific promoter is selected from the group consisting of a LEASHI promoter, a *rrnB* promoter, an *anr* promoter, a *ProC* promoter, a *hla* promoter, a *SrcB* promoter and a TSST-1 promoter.

17. A nucleic acid comprising the nucleotide sequence of the LEASHI promoter, as presented in Figure 1B (SEQ ID NO.1).

18. A vector comprising a recombinant nucleic acid encoding one or more toxic agents operably linked to a pathogen-specific or tissue-specific promoter.

19. A modified virion comprising a recombinant nucleic acid comprising a nucleotide sequence encoding one or more toxic agents operably linked to a pathogen-specific or tissue-specific promoter.

20. The virion of claim 19 which is a bacteriophage.

21. The bacteriophage of claim 20 which is a P1 bacteriophage.

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The bacteriophage of claim 20 which further comprises a mutated *pac* site or a mutated *pacABC* gene.

The virion of claim 19, wherein the virion has a reduced ability to transfer DNA originating from the virus, and wherein the virion is capable of transferring the recombinant nucleic acid.

The virion of claim 19, wherein the nucleic acid encodes a toxic agent selected from the group consisting of *ccdB*, *kid*, *perK*, *parE*, *doc*, *higB*, *chpAK*, *chpBK*, *kicB*, *hoc*, *srnB*, *flmA*, *pmdA*, *relF*, *gef*, *kilA*, *kilB*, *kilC*, *kilE*, *traL*, *traE*, *sigB*, *hok*, *pemK*, *lysostaphin*, and *kika*.

A method of inhibiting replication of a pathogen in a subject, comprising administering to said subject a recombinant nucleic acid comprising a nucleotide sequence encoding one or more toxic agents operably linked to a pathogen-specific or tissue-specific promoter.

The method of claim 26, wherein the pathogen is a bacteria.

A method of inhibiting replication of a pathogen in a subject, comprising administering to said subject a modified virion comprising a recombinant nucleic acid comprising a nucleotide sequence encoding one or more toxic agents operably linked to a pathogen specific or tissue-specific promoter.

The method of claim 28, wherein the virion is a bacteriophage.

The method of claim 27, wherein the pathogen is bacteria.

A pharmaceutical composition comprising the modified virion of claim 19,  
and a pharmaceutically acceptable carrier.

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